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Cash flow risk management in the property/liability insurance industry: a dynamic factor modeling approach. (English) [Zbl 1393.62049](#)
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Summary: This study proposes and demonstrates a dynamic factor model that can be empirically carried out by the utilization of a factor-augmented autoregressive technique to explain and forecast the time-varying patterns of cash flows of insurance companies in the United States. A principal component approach is employed in the Factor-Augmented Autoregressive Model (FAARM) to capture the augmented factors that are to be utilized for forecasting. We describe the cash flow statistical model by a dimension-reduction technique that can depict the dynamic patterns of the cash flows of insurance firms and then measure the FAARM model. Results from the first step (principal component analysis) help capture the macroeconomic variables and the variables pertaining to insurance companies' cash flows, namely, cash flows from investment, underwriting, and risk management activities. Results from the second step offer evidence supporting that the FAARM improves the out-of-sample forecasting accuracy assessed by a forecasted root-mean-squared error (FRMSE). This article presents a set of feasible FAARM models from which an insurance firm can choose one that can be a better fit to the firm corresponding to its specific firm characteristics, such as firm size. Consequently, the chosen FAARM(s) can improve the accuracy of cash flow forecasting and thus can help insurers to manage risk via cash-flow-matching techniques.

MSC:

62P05 Applications of statistics to actuarial sciences and financial mathematics

62H25 Factor analysis and principal components; correspondence analysis

91B30 Risk theory, insurance (MSC2010)

Keywords:

cash flow risk management; property/liability insurance industry; dynamic factor model; factor-augmented autoregressive model; principal component analysis

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